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plutonium. So much moving around -- I was going to try to take all those moving around because it not only seems to be moving materials from Texas to South Carolina, and then from there to nuclear reactors, but they have to get special materials from other places, and I thought it would be good to have a visual to see all of those routes intersecting and how many different areas of the country would be affected and exposed to the problems with transportation and accidents.

There's not enough justification for the proposal for mixed-oxide fuel in terms of factual data. Only a limited amount of information is included about the past history of operations which are related to other facilities which involve plutonium, particularly reprocessing plants.

There's nothing about nuclear fuel services, New York State, Cogema, British reprocessing, and all the hearings lately that went on about the bio-nuclear fuel reprocessing plant in which our organization was involved over a period of five to seven years.

These documents have information

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that need to be included in references, and I've seen none of this.

Then there's the defense waste processing facility. What is the status of that, and is that available for identifying both high-level and plutonium?

As I understand it, the problem with the Savannah River defense waste processing facility is the intank precipitation process.

The releases of benzene, for example, in the development of the salt cakes, which leaves not only a fraction, as I understand it, of the sludge available for the defense waste processing. There's inadequate information regarding reprocessing and how a change in nuclear policy would affect security issues.

Is it possible to recover plutonium once the plutonium goes through the vitrification process?

I haven't given you time to answer these questions.

Options which might offer a better chance for accomplishing the goal of protecting against the theft of plutonium by terrorists or

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used by other countries are not included in the draft EIS. I feel that it does not come up to the standard of the National Environmental Policy Act.

And I've got 100 other questions, but I know I want to give other people a chance. Thank you.

SENATOR LEVENTIS: Thank you, Ms. Thomas. Let me just say that you've raised a number of questions, and we appreciate that. We do want to try to get everyone in, especially if the questions have been asked before, please take those answers.

As far as specific issues in the document that are difficult to follow, I think that you need to raise some specifics to these gentlemen so that they can hopefully address those.

Some of the other questions I'd certainly defer to DOE, but I think it's important to recognize -- and I forget which one of the gentlemen said it -- the direct question about how the program was initiated for MOX, that it definitely was initiated by the administration at the State Department as

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opposed to DOE although, I know there must have been consulting on the issue, but I'll defer to DOE to answer questions about the defense waste processing, security, et cetera, vitrification and reclamation.

MR. NULTON: I'll just try to hit some of the high points if I can.

The EIS does not address reprocessing because we don't propose to do any reprocessing of fuel.

The purpose of the program is to have a once-through fuel cycle, so this plutonium, once it is used in MOX fuel, would go to a geological repository and would not be reprocessed.

At this point, the United States has a policy not to reprocess fuel from commercial reactors.

With regard to the defense waste processing facility at Savannah River, the immobilization approach that we've described in the EIS does propose to use a high-level waste immobilization facility, either at Hanford or at Savannah River.

At this point in the EIS we have

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identified Savannah River as the preferred site for immobilization because the DWPF is already built and is already operating, and it's less expensive and more timely to use it for immobilization.

The process that we've proposed is to take the plutonium and to immobilize it into a ceramic form, about the size of a hockey puck. Then we stack these hockey pucks in this stainless steel can, and those cans are imbedded in the high-level waste canisters that are produced in the DWPF.

We cannot mix the plutonium directly in with the immobilized waste without having to make either a new facility or substantial changes to the DWPF.

And also, there were questions on the chemistry of the glass, whether or not we could come up with a suitable chemistry if we were to mix plutonium in with the rest of the waste materials.

So the less expensive and more scheduled effective way of doing this is to immobilize it separately, and then imbed it in the high-level waste.

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Can you recover plutonium from immobilized waste? Yes, you can. You can dissolve the glass. You can move the plutonium back out of the immobilized form. That's one of the concerns the Russians have raised in our negotiations with the use of immobilization.

Nonetheless, we do plan to use immobilization as one of the two approaches.

I would mention here because I may not have made it clear before, the purpose of the hybrid approach of having both MOX and immobilization was to make sure that we had at least one -- I mean, we think both will work. We intend on a track to implement both. The idea of having at least two was, if you had problems with one, you would have at least one successful technology.

As you've mentioned, Ms. Thomas, we've had problems with the intank precipitation at Savannah River. I think we'll get those resolved but it's concerns of that type that drove us from the beginning to have at least two technologies available to us so that if one ran into problems, we would at least have one remaining that would work.

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SENATOR LEVENTIS: Didn't you also tell me earlier about reclamation after immobilization that it was economically more expensive to do than just to process plutonium to weapons-grade quality to begin with?

MR. NULTON: I'm not sure if I understand the question. Certainly we don't intend that we'd ever take it back out of the immobilized --

SENATOR LEVENTIS: No, we don't, but if we needed that quality plutonium, wouldn't it be easier just to process?

MR. NULTON: Oh, produce new plutonium?

SENATOR LEVENTIS: Right.

MR. NULTON: I don't know, but I suspect it would be less expensive to dissolve the ceramic pucks.

SENATOR LEVENTIS: I misunderstood that.

MR. NULTON: I think you could dissolve it fairly quickly, but I don't know.

Charlie, you may want to comment on that.

MR. ANDERSON: I'm not sure.

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MR. NULTON: You need a reactor to make new weapons-grade plutonium. We don't have one right now that can do that.

SENATOR LEVENTIS: Thank you.

I'm going to call on Mary Olson. After Ms. Olson, Jim Kearse, so if you would be ready.

MS. OLSON: I'm just going to be brief tonight, but tracking this process and looking at the numbers in the supplemental EIS on reactor impacts -- this would be a question for the Department of Energy -- the supplemental EIS shows that in the rather rare event that we've had Chernobles, we've had it happen -- of a reactor accident that were to expel core materials, as in fuel, to the environment, that using plutonium fuel in reactors does increase the number of latent cancers that would be expected from that event, which clearly there would be cancers from uranium being dumped in a similar way, but there would be an increase in the number associated with using plutonium fuel.

An independent study done by Dr. Ed Lyman has also estimated this number and showi

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a significant increase of risk.
Working for an organization that tracks the status of the operating reactors in the United States, we're well aware of the influence of both aging on reactors, and the impact of intense heat and radiation, degrading the metals that the reactors are made of, and also the impacts of the deregulated utility environment, in terms of the needs for corporations to cut their costs and become competitive.
And those things combined with the difference between the fission physics of plutonium and the difference compared to uranium lead us to feel that there is an increased risk in the possibility of accidents, incidents, releases above what operating uranium in reactors currently demonstrates, so increased chance of an accident or incident coupled with increased consequences of such an accident or incident, we are in a need for process here. I would like a clear statement from the Department of what the justification is for exposing the reactor communities to this increased hazard.

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MR. NULTON: Okay, I may ask Duke to jump in here, if you feel you have to.
I think, first of all, the events that Mr. Lyman addressed in his study were beyond design basis events. Let me see if I can put this in layman's terms. These are not normal operating kinds of events. They are very, very low probability events, one-in-10-million, one-in-100-million kind of events.
There are two or three of those events which would result in a release of plutonium.
In most events that occur in a reactor, you release fission gasses, but you don't release the actual plutonium or uranium metal that's in the fuel.
However, there are these very, very low probability events that would release plutonium, and as Ms. Olson points out, there's already plutonium in normal reactor fuel that is built into that fuel as it is irradiated in the reactor.
If those very rare events occur, there are some increases in latent cancer

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fatalities, and our own numbers show that, and they're, I think, fairly consistent with Mr. Lyman's.
As someone pointed out in one of our earlier meetings, the fuel that we use in reactors today has very, very few failures. There's almost no failures, so these are extremely low probability events.
As far as the degrading materials, the reactor components, the reactor vessel, and so forth, the utilities, as I understand it -- and you may want to jump in here -- will use a fuel cycle or a fuel -- they will put the MOX fuel in the core in a way that it does not degrade their reactor vessel or materials.
I assume they're going to put the fresh fuel in the center of the core, and as it burns down, they'll move it into the outer regions, but it will be managed at the fuel location. The location of the MOX fuel will be managed in a way that will have minimal impact on the materials and systems in that reactor.
As far as deregulation pressures, you know, I can't speak for the utilities, but I will say that part of our procurement process

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was to look for reactors that were financially healthy, that had good operating records with the NRC, and we believe that the Duke reactors and the Virginia Power reactors fit that bill, that they are well run and some of the best reactors that operate in this country today with a very good safety record.
So we feel that this is a safe program, and again, it will be regulated by the Nuclear Regulatory Commission, as will the fuel fabrication plant. We could have regulated that within the Department, but we felt that we wanted to use the Nuclear Regulatory Commission. They're an independent agency. They regulate other fuel fabrication facilities, so we believe that this is a very safe endeavor.
SENATOR LEVENTIS: Thank you. After Mr. Kearse, Dr. Mary Kelly.
MR. KEARSE: I'm Jim Kearse, Barnwell County Council.
How many of these people on this panel to the right are from South Carolina? I'm just curious.
SENATOR LEVENTIS: Mr. Brown is from

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Charleston. Ms. Pierce is our research director.

MR. KEARSE: The reason being is, the committee from South Carolina, Barnwell, Aiken, Senator Brad Hutto, Representative McCade -- we went and talked with DOE, Dave, and begged them to bring this process to South Carolina.

What I'm hearing here tonight is some people that doesn't understand what we're going to get from this.

When I was riding up here, I saw a beer can roll across the road, and I thought about the bad things that come out of it. One was death, and the other is split families. Innocent people die, but then there's some good things that come out of them beer cans. You end up with maybe a lawn chair to sit on the beach with after it's recycled.

When you look at plutonium going into MOX fuel, we'll end up with electricity in South Carolina, New York, Washington, wherever. We'll have something coming back to us that we've already paid for. We used it as a weapon of war, and now we're going to use it for peace

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times.

All I'm wondering is when we're going to get started. Dave, do you have an answer for that one?

MR. NULTON: Yes, as we touched on very briefly earlier, we are now in the process of initiating design of the fuel fabrication facility. Construction will start in the 2002/2003 time frame and will begin fabricating fuel around the 2006 time frame.

MR. KEARSE: Thank you.

SENATOR LEVENTIS: Dr. Kelly?

After Dr. Kelly, Mr. Lewis Zeller.

DR. KELLY: My name is Mary Kelly, and I have been following these nuclear issues -- I hate to tell you this -- but since before the bombs dropped in Japan.

As a chemist, I have been kind of tuned in, and a lot of what goes on I find deeply troubling.

I am aware of the fact that the nuclear reactors that we now have a finite time frame during which they can operate.

I've seen places where it says -- that had to do with the ability to borrow the

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money to build those reactors. However, the other factor involved is the aging of these reactors so that they are no longer safe.

At a recent meeting, I believe it's the one -- there was a recent meeting in Augusta with a subcommittee of the National Science Foundation, and I was able to ask some questions over there.

I was told on this question of -- the reactors are reaching the end of their lives and are slighted to be decommissioned, that they had picked reactors that have as much life in them as they need, and now people are talking about 10 to 12 years over which this MOX fuel is to be burned, but the figure that I was told over that meeting was six years. That's one of the things that I find troubling.

The other one is the question of criticality. We don't often hear anybody talking about criticality, but it is an important issue. We talked about it tonight in terms of the lines from the -- I believe from the tanks.

However, we are assembling a tremendous amount of nuclear material at the

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Savannah River Site, and something that kind of lit a light bulb in my head was an article I read in the Wall Street Journal some months ago talking about North Korea.

North Korea, according to the Wall Street Journal, is almost in a situation where they can blackmail the rest of the world because who is going to go in and bomb nuclear facilities? No one in their right mind.

However, we live in a world filled with terrorists and countries that might get the capacity to deliver a missile. What is going to happen if one gets dropped on the Savannah River Site? You know, that is something that does occur to me, so I think there are a great many troubling questions about this whole thing, and we do need some candid evaluations and the belief that we can really trust what we are being told. Thank you.

SENATOR LEVENTIS: Mr. Nulton, I think one of the issues that Dr. Kelly has raised might be invited by saying, are any of the proposed plants that are going to burn the plutonium, the MOX fuel, scheduled to reach

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their service life end before 2020?
MR. NESBIT: Do you want me to take that, Dave?
MR. NULTON: Go ahead.
MR. NESBIT: We've got six mission reactors proposed for plutonium disposition. Of those, two have licenses which expire before 2020 or in 2020. That's North Anna Unit One in 2018 and North Anna Unit Two in 2020. The McGuire and Catawba Units licenses expire between 2021 and 2025.
We have an irradiation plan for accomplishing the plutonium disposition mission that would accomplish it in the six mission reactors without relying on any extension of that license lifetime beyond the original 40 years.
We've also done evaluations to address aging, specifically on the reactor vessels, which is one of the primary concerns.
As Dave alluded to earlier, when responding to Ms. Olson's question, due to the field management schemes that we use, there's relatively no or close to no impact on the aging of the reactor vessel due to using

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mixed-oxide fuel, and we'll be able to demonstrate a large safety margin in that area, so we're not relying on license extension to accomplish the program. However, I will add that at Duke Power we are in the process of applying for and obtaining a license extension for our Oconee reactor in South Carolina. We're very optimistic about getting that license and using that reactor for up to 60 years.
SENATOR LEVENTIS: The security concerns at Savannah River Site, without breaching any security, do they include airborne as well as surface threats?
MR. ANDERSON: (Nodding head.)
MS. CARROLL: Can you put a nod on the record?
SENATOR LEVENTIS: I used to fly over that place in a plane carrying bombs all the time. It was one of ours.
All right. Next is Mr. Louis Zeller. After Mr. Zeller, Ernie Chaput.
MR. ZELLER: Thank you, Senator Leventis. My name is Lou Zeller. I'm on the staff of the Blue Ridge Environmental

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Defense League since 1986.
The Blue Ridge Environmental Defense League opposes the use of plutonium fuel in commercial power reactors. The plant's use of mixed-oxide or MOX fuel is unsafe, uneconomical, and unnecessary.
MOX fuel use in reactors operated by Duke Energy and Virginia Power would set a dangerous precedent in the nuclear industry by needlessly exposing many people to the risk of additional radiation exposure from a plutonium fuel power plant accident.
The program is experimental, in that no reactor has ever been operated with fuel derived from weapons-grade plutonium.
I'd read an excerpt from a letter written on May the 17th of 1999 from the advisory committee on reactor safeguards to the chairman of the Nuclear Regulatory Commission.
It states that, quote, The U.S. Department of Energy is proposing to dispose of some fraction of the nation's excess weapons-grade plutonium by converting this plutonium into MOX for use in commercial nuclear power plants. There is, however,

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rather limited operational or regulatory experience with the use of MOX in the U.S. Even the experience in other countries is not extensive.
Safety margins will be reduced because reactors designed for uranium fuel will be using plutonium fuel. These are my words. Without modifications of the plant, containment vessel, inspection schedules, and maintenance procedures, the increased danger of a reactor will be hidden by an outwardly normal appearance. It's like a land mine which could go off when least expected.
I want to dwell on just two points here tonight: One is the transportation of plutonium fuel and also issues of reactor safety.
The transportation hazards in emergency response to a rail or a highway accident must be well prepared and rapid. Delays in response to accidents which involve the release of radioactive materials would expose unknown numbers of people to negative health effects.
In 1996, a Department of Energy

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Transport and Safeguards Division, Safety-Co transport trailer carrying nuclear weapons slid off a road and rolled over in rural Nebraska.

Four hours elapsed before DOE headquarters were notified, and it was 20 hours before a radiological assistance program team determined there was no release.

A similar delay in response to a MOX fuel accident could make effective emergency response dangerous and cleanup impossible.

The following comment by the Georgia Environmental Protection Division cites, Vehicular tests of materials deposited on roadways, it takes issue with the DOE's approach to emergency response to accidental plutonium fuel releases.

It says, quote, "After a passage of about 100 cars, only a small fraction of the original contamination remained on the road surface. Unless emergency officials promptly closed the accident scene to vehicle traffic, an unlikely situation, emergency responders may face an incident scene that is, unknown to them, extremely hazardous due to respirable plutonium. Post-emergency actions may also be

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complicated due to the enhanced spread of contamination by vehicular traffic."

These are the words of the Georgia Environmental Protection Division from their comments to the Department of Energy.

SENATOR LEVENTIS: I appreciate your concerns, and we'd be happy to put anything in the record.

What, I think, would be of more significance this evening would be to pose questions that these gentlemen can respond to because their expertise is available to us, so if we could sort of go in that direction, it would help.

MR. ZELLER: Yes, sir. I understand. In fact, I was just about to get to some questions, which might be to the liking of the representative from Duke Energy and from Cogema with regard to reactor safety.

French test results suggest that plutonium fuel is more unstable than uranium fuel.

In 1997, a MOX fuel rod violently ruptured when subjected to test conditions designed to simulate an accident. The uranium

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fuel rod in that same test did not rupture.

Again, the letter from the advisory committee to the chairman of the NRC stated that, We're aware of experimental studies that show there to be enhanced release of fission gasses to the fuel cladding gap during reactor operations with MOX relative to conventional fuels.

We're also aware of anecdotal accounts from the results of Laquores test in France dealing with the release of volatile radionuclides, such as cesium, from MOX under severe accident conditions.

The results of these tests revealed that during the early stages of core degradation, releases of volatile radionuclides from MOX are more extensive than from conventional fuels at similar levels of burnup.

Does anybody care to address those test results?

MR. NESBIT: We're aware of the Capri tests in France. One of the team participants, Electricity to France, is a sponsor of those tests. They happen to be the world's largest user of mixed-oxide fuel. I

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believe they have 17 reactors in France now loaded with mixed-oxide fuel and using it.

I make that point to emphasize that this is not an experimental program. It's a mature, proven technology. It's been done safely for years and years.

The performance of mixed-oxide fuel in nuclear reactor cores over decades, primarily in Europe, but also in the United States and Japan, has been comparable to that of uranium fuel.

Concerning the Capri tests specifically, the tests involved nine reactivity insertion accident simulations in a sodium cooled reactor core. The intent of the test was to fail some specimens in order to determine when the specimens would fail.

Six of the tests were uranium fuel. Three were MOX fuel. One of the uranium fuel tests experienced failure, so did one of the mixed-oxide fuel tests.

Our evaluations indicate that the energy deposition rates at which the mixed-oxide fuel failed were significantly in excess of any that could be seen in one of our

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cores operating from mixed-oxide fuel in the extremely unlikely event that this accident took place in the first place.

All in all, I want to reiterate and point out that the performance of mixed-oxide fuel has years and years of experience behind it in Europe, and it has been exemplary.

If we thought otherwise, Duke Energy would not be involved in the program. We have a tremendous financial investment in these plants. Our workers work there. We live in the plant communities. We'd be crazy to do something that we didn't think was safe.

By the time we'd get to the point of actually irradiating mixed-oxide fuel in our reactors, we will have thoroughly evaluated the entire spectrum of potential accidents that could occur, we will have submitted these evaluations for Nuclear Regulatory Commission review and approval, and they have to give us their specific regulatory approval before we can go forward with the program.

MR. ZELLER: I hope that's some of the concerns of the advisory committee on reactor safeguards regarding the limited

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experience of MOX fuel, that you would help provide some information to them, because apparently, they feel that this experience is rather limited.

With regard to reactor safety, once again, at the Catawba plant and the McGuire plant, safety hazards in such plants are a combination of human and technical error. Both types of error are noted in the Nuclear Regulatory Commission's most recent plant performance review of the McGuire, Catawba, and the North Anna reactors.

The NRC's plant performance review, which was completed on March the 25th of 1999 says that, Unit One experienced forced outage of approximately three weeks in duration due to blocked flow channels in portions of the ice condenser, which is part of the containment structure.

Problems in maintenance programs and processes included examples of surveillance deficiencies for ventilation systems and ice condensers.

And the third one is, the engineering performance decline was a result of

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deficiencies in auxillary filling ventilation system testing, overheating a vent in the upper surge tank, and degraded conditions in the Unit One ice condenser.

While the issues were ultimately resolved properly, each had its roots in poor engineering performance. These are the words of the Nuclear Regulatory Commission in their review.

The NRC has a mandate to protect public health and safety. The findings from the Cook plant, which uses also ice condensers, indicate that both of its units may not have protected the public had there been an accident.

SENATOR LEVENTIS: Mr. Zeller?

MR. ZELLER: Yes.

SENATOR LEVENTIS: I have to ask you to get to a question. These things that you're pointing out certainly are a matter of record and are important, and we'd be more than happy to hear them. But we really have no access to any kind of resolution of those. If you have a question that you could ask, it really would be helpful.

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MR. ZELLER: Sure, the Catawba and McGuire both utilize the ice condensers, which I mentioned, which absorb energy to allow smaller physical containment structures to contain accidental releases from its reactors.

The ice condensers must work in a reactor emergency, similar to an air bag in an automobile. You don't get a second chance.

The Donald Cook plant, like I mentioned, uses similar technology and has been shut down since 1997 because of ice condenser problems. This is a fundamental problem with the containment in the case of an accident within -- in the reactor.

Is it wise to proceed at Catawba or McGuire with the MOX fuel before the ice condenser problems are solved?

MR. NESBIT: The NRC has no regulatory issues with the design or operation of our ice condensers at McGuire and Catawba. That's why our plants are up and running. And yes, we think it is wise to proceed with the mixed-oxide fuel program at McGuire and Catawba.

MR. ZELLER: Well, then, in closing,

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I guess I should add one more point from the advisory committee on reactor safeguards.
She said that public attention has been drawn to the higher actinide inventories available for release for MOX banned from conventional fuels. She states, "Significant releases of actinides during reactor accidents would dominant the accident consequences. Models of actinide release now available to the NRC staff indicate very small releases of actinides from conventional fuels under severe accident conditions." In other words, MOX fuel is more dangerous and will cause more harm to the general public in the case of an accident.
Senator Leventis, I appreciate the opportunity to talk to you today. A total of 3.7 million people live within 50 miles of the McGuire and the Catawba nuclear power stations, and another one and a half-million live within 50 miles of the North Anna reactor, yet the Department of Energy did not see fit to have public hearings in those communities -- but to hold a long hearing in Washington DC on a weekday during working hours. Our written request to the Secretary of Energy for

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additional hearings met with rejection.
The unprecedented veil of secrecy which envelops this civilian project threatens to undermine free debate on important issues of public policy.
Senator Leventis, on behalf of the Blue Ridge Environmental Defense League, I want to express our gratitude to you for holding this public meeting in Columbia, and I appreciate the inquiry to the DOE's plutonium fuel program, which you have initiated. Thank you for the opportunity to address these people today.
SENATOR LEVENTIS: Thank you, Mr. Zeller.
Could you address the notion of public hearings? I know that's been an issue. You all were kind enough to come at my request, but could you go over that just a little bit?
MR. NULTON: We will consider these requests as we get them, but we have set up at this point that there will be a public process related to the license modification that will be required for each of these reactors to burn MOX fuel. That will be conducted by the

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Nuclear Regulatory Commission. And we believe that will provide the public with the opportunity that they need.
SENATOR LEVENTIS: Thank you, Mr. Zeller.
MR. ZELLER: I have additional remarks in writing. I will hand them to the reporter or --
SENATOR LEVENTIS: I think if you will hand them to Ms. Pierce, that will be fine. Thank you.
After Mr. Chaput is Rita Kilpatrick. Mr. Chaput? I hope I pronounce that correctly.
MR. CHAPUT: Thank you, Senator. With a name like Chaput, we answer to almost anything. Thank you, very much.
SENATOR LEVENTIS: Before you begin, I'm looking at about 20 people who would like to speak, and I would like to hear them, and we will stay, but in deference, please see if we can focus on questions that this panel can answer.
MR. CHAPUT: Yes. I do have a statement I'd like to submit. I will skip the statement and just go right to the questions.

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SENATOR LEVENTIS: Thank you.
MR. CHAPUT: I'm with the Economic Development Partnership in Aiken, South Carolina. We've made extensive studies of the activities being conducted and proposed were being conducted at Savannah River Site to make sure it meets the community's expectations with regard to the types of programs that can be conducted safely at that site.
We had an important role in winning the Cold War. We want to have an important role in sort of the next step as the Cold War winds down, as the National Academy says disposing of excess plutonium constitutes a -- you know, that those materials constitute a clear and present danger to national and international security.
We want to have a role, and we think we have the right capability to assist in that important national goal.
If the overall objective is to make 100 metric tons -- 50 in our countries, 50 in Russia -- of weapons-grade plutonium less attractive or ideally unusable for weapons, nuclear weapons, then that can equate to, as I

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understand the literature, as many as 20,000 nuclear weapons, 20,000 nuclear weapons.

What is the best form for that plutonium to be in? You know, is the form of that material better off as weapons-grade plutonium or reactor-grade plutonium?

I think, as this panel said, you can make a weapon out of reactor-grade plutonium, but which is the better form, whether you're a national state making weapons or a terrorist group who wants to make one weapon? Which is the better form of the material to make that weapon? That's my question.

MR. NULTON: That would be the weapons-grade material.

MR. CHAPUT: As I understand it, there would probably be three reasons for that: Number one, reactor-grade material is more difficult to deal with. Secondly, reactor-grade material is more sensitive and more difficult to make critical. And third, if you have the same amounts of material, you get less of a nuclear yield with weapons-grade plutonium; is that correct?

MR. NULTON: Yes.

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MR. CHAPUT: In all three cases.

So you're better off, the world is safer with reactor -- all that plutonium being reactor-grade as opposed to weapons-grade, so what we ought to be doing is reducing the threshold, the attractiveness, and the usability of that material, the ability for people to use it and to make modern weapons, small weapons, reduce the ability to do that by denaturing that material, isotonically altering it and making it reactor-grade plutonium.

My second question is -- I don't know if you specifically addressed it or not, Dave Nulton, but if the -- there is a concern on the part of the Russians, as I understand it, about the U.S. plans for disposition.

If the U.S. goes 100-percent immobilization -- and I think you said you can recover weapons-grade plutonium from the immobilized form; is that correct?

MR. NULTON: Yes.

MR. CHAPUT: If the U.S. goes 100-percent immobilization, will the Russians sign up to this program and dispose of their material?

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MR. NULTON: No, they would not, if we go 100-percent immobilization.

MR. CHAPUT: So if we insist on 100-percent immobilization, the program falls apart, none of the material gets dealt with, the world does not -- we don't end up disposing of any of our materials either in this country or in Russia; is that correct?

MR. NULTON: That would be correct, yes.

MR. CHAPUT: I think if we looked at it from the standpoint of what's the right thing to do for our generation and the future generations, let's take the steps that we can take. Take that material. We'll go through a once-through cycle, keep jawboning the Russians, let them -- hopefully they will step away from reprocessing, address some of these other concerns, but the world is better off going MOX than going nothing. And if you insist on total immobilization, you get nothing.

SENATOR LEVENTIS: I think that probably is a question for the administration to ask because they may come back with a

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bilateral agreement that might be different than that. We have already heard the Department of Energy say that if the Russians step away from the program, that they will do away with MOX, but we also would have to be under the impression that if the Russians step up to a different program and accept our immobilization, that we would do that, so I don't know that we're going to resolve those issues right here, Mr. Chaput.

MR. CHAPUT: But everything I have heard, that is consistent with the answers I got tonight, is that the Russians will not accept a program where they believe the U.S. government can go back in and surreptitiously take the weapon grade plutonium out of the immobilized form. They don't trust us frankly probably any more than we trust them.

You know, there are hardliners in Russia, just like there are hardliners over here. They want to be assured. They may be looking for some excuse to put their program back.

I guess the important thing is: What are we trying to achieve? We're trying to

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take as much of this material and reduce it and its potential for application in nuclear weapons to the maximum extent possible. MOX seems to be the only way which that's going to happen. Let's not lose sight of that. For the sake of not necessarily us, but our future generations.

SENATOR LEVENTIS: Thank you.

MR. CHAPUT: Thank you, and here's my statement.

SENATOR LEVENTIS: Thank you very much. Ms. Kilpatrick. Then after her, Ms. Julia Pearson.

MS. KILPATRICK: Yes, good evening, and thank you for this opportunity to ask a couple questions. I will try to make them very brief, but we haven't had an opportunity like this to ask such questions.

I work for and am the director for an organization campaign for Prosperous Georgia. We're an energy consumer based organization.

I wanted to follow up on an issue that the fellow who laid out for us earlier the idea that MOX may significantly boost the

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energy supply to South Carolina -- I want to better understand what actually is estimated to be the amount of electricity in terms of capacity and demand that Duke Power, for example, would expect to generate from MOX fuel, and what is that in comparison to your total capacity demand per year?

MR. NESBIT: Okay, our system is approximately 60-percent nuclear right now, of which about two-thirds of which would be Catawba and McGuire, so about the time the program would be in place, we would be generating, depending on electricity demand, growth, et cetera, at the time the program were to start, maybe 30 to 40 percent of our electricity from units that have some mixed-oxide fuel in the cores.

I'd like to point out that in the case of Catawba, Duke is a 12-1/2 percent owner in that plant, and that the remainder of the plant is owned by four municipalities and co-ops that were not the complete owner of that plant. The electricity actually goes to other organizations.

MS. KILPATRICK: Do you know the

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actual electricity output that the MOX itself would generate?

MR. NESBIT: It would be approximately 1,050 megawatts per unit, so if all four units are operating, that's on the order of 4,000 megawatts of electricity.

SENATOR LEVENTIS: But wouldn't it be fair to say that it's no different than they're doing now, or that they would do subsequent to --

MR. NESBIT: Yes, sir, absolutely. Those units will be operating irrespective of whether this program is in place or not.

SENATOR LEVENTIS: Is it your question, is it going to be a greater output?

MS. KILPATRICK: That's my question. What contribution does it actually have?

MR. NESBIT: Oh, the power generated by the station will not change.

MS. KILPATRICK: All right, that's what I had understood, and I just wanted to make sure I had the right understanding.

Another question has to do with polling. I know I asked you at the break time, and you didn't know the answer to the question

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of whether Duke Power has done any customer polling.

It's occurring more frequently now across the country where utilities are concerned when they face deregulation what their customers would choose in the way of a utility provider, fuel types, or concern in environmental impacts, cost impacts, et cetera.

I don't know if there's anyone from Duke Power here in the audience who might be able to speak to whether the company has carried out any polling of its customers to determine if any customers are showing a real strong interest in purchasing electricity generated by plutonium based MOX.

MR. NESBIT: As I indicated, I'm unaware of any such polling, but I can't guarantee that it hasn't taken place.

MS. KILPATRICK: Do you have anything to offer along those lines, either for Virginia Power, Duke Power customers? The polling information that we have is showing what we're understanding to be fairly consistent results, that when given a preference, the majority of consumers are

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indicating that they would prefer to buy energy that is drawn from renewable energy, energy conservation sources, rather than fossil fuels and certainly more than nuclear power.

So is there a -- what we would like to have a sense of is whether there's been any customer demand assessment polling done yet; or if not, is that anticipated in your plans?

MR. NULTON: I'm not aware of any polling that's been done. Utilities certainly know, and I don't know if they intend to do it.

MR. NESBIT: I don't think there has been. I can check and get back with you, Senator.

SENATOR LEVENTIS: In that regard, not Duke, but DOE -- Dave, I know that the Department of Energy gave a fairly substantial grant to the medical university to look into the matter of our acceptance of nuclear waste in the state.

So if you would -- it may be a part of the agency that looks into the those things, please let us know, and we can let Ms. Kilpatrick know.

Next would be Ms. Julia Pearson, and

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after her Mr. Kawaguchi.

MS. PEARSON: My question was already answered, if you'd like to go ahead.

SENATOR LEVENTIS: Thank you very much. In that case, Tomo. Then after him, Mr. Bob Guild.

Please pronounce your name correctly, and accept my apologies.

MR. KAWAGUCHI: Good evening. My name is Tomo Kawaguchi. I'm just a concerned citizen, also. I'm a marine biologist.

My first question is I think an issue of credibility of DOE. I recently read a newspaper article on waste treatment facility at the SRS, 500 million dollar total facility have failed, but basically I still haven't digested sort of the article itself.

In other words, that's lots of money, and so many people could have been hired by this money, but I guess we are not ready to sort of proceed a new project, I think. I think we still need a lot of time to really digest this sort of particular incident, because SRS is particularly designed for containment of those wastes, nuclear wastes.

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I've seen almost -- first time that radioactive fish, contaminated fish in Savannah River, so I think -- can we really trust the DOE to do this project? That's the first question.

The second question is: If this project is to start, are we -- in Columbia, are we getting plutonium contaminated clothes at INS located South of Edisto Avenue? That's second question.

And I guess the last question is the security issue. I think the U.S. taking dual position that -- one is immobilization, and the other one is this MOX fuel issue, MOX fuel, but I think you said that if one of them failed, you can choose one of them. But if the MOX fuel failed means not only the safety -- I mean, environmental safety, but also if terrorists gets this, it is sort of the end of the world in my concern.

So I think transporting this MOX fuel into three different locations to me means triple the sort of safety concern and the danger, so I think we really need to go slow on that, and so those are three sort of my

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concerns, and also the questions I'd like to know.

SENATOR LEVENTIS: Thank you very much. The question of proceeding, question of waste, especially as it applies to us here, and then the question of security and transport after it's MOX.

MR. NULTON: The first question -- can you trust DOE, well, I think you can. I certainly hope that you can.

Again, the Nuclear Regulatory Commission will license and regulate both the fuel fabrication facility and the reactors that will irradiate the MOX fuel.

Secondly, can you expect plutonium contamination. I don't think there will be any plutonium contamination, any measurable plutonium contamination from these facilities.

Thirdly, terrorists have not -- are more of a concern, I think, in Russia than in this country, but I think to the extent that terrorism is a concern, it's going to be a concern for both immobilization and MOX.

There's transportation associated with each of these technologies in getting the

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materials from their current location to the Savannah River Site, where this work will be done.

It is true that there will be the additional transportation of the fuel that is fabricated at Savannah River to the reactor site.

At that point, the plutonium is mixed with uranium. It's then pressed into pellets. Those pellets have been centered. They're in beveled tubes. The tubes are in fuel assemblies. The fuel assemblies are in a cast. The cast is in an SST truck. The chance for any diversion of material at that point is extremely remote.

I also want to say -- and this may respond to an earlier comment that was made -- that all transportation of materials will be conducted in the department safe, secure transport trailers.

And as Mr. Zeller pointed out, there was a situation in Nebraska where a truck went off the road, but these are extremely rare situations. In over 94 million miles of transportation of materials around the country,

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in many cases, perhaps most cases, transporting the weapons that the Senator mentioned were on his plane, we have had no release of radioactive materials.

These materials are transported in containers that are very, very robust. They go through a number of tests, fire. They're put in very hot temperatures, where they're dropped from pipes onto concrete pads, slammed into walls. They're put under water at high pressure. They are designed not to break open under even extraordinary circumstances. Then they are put into these SST trucks.

So we believe that the transportation of these materials is very safe.

SENATOR LEVENTIS: Thank you.

Bob Guild and then Mr. Peter Sipp.

MR. GUILD: Thanks, Senator. I very much appreciate, as do all of us, your willingness to invite the Department and others to address these important issues.

I would note that the Department would not be here had it not been for your request, despite the fact that the public has been clamoring for some time that DOE come to

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communities most directly affected by this proposed program and address the public's concerns. So thank you, again, Senator.

I want to just state unequivocally -- Bob Guild is my name. I'm an environmental lawyer. I was involved in the licensing proceeding for the Catawba reactor, so I have some familiarity with some of the quirkiness of their designs, as referred to by Mr. Zeller earlier. I share his concerns.

I wanted just to state that my view is that the government should be pursuing with full zeal the immobilization program exclusively.

I think it's just outrageous to suggest that the Russians are dictating terms of the program we're going to follow, particularly since we're paying the bill for whatever program they choose to adopt.

It seems to me we have all the cards here, and it's absolutely outrageous to suggest that somehow we're driven to a second best program, a program that involves experimentation and undue environmental risk because the Russians insist on it, so I

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encourage us to forget that notion that we have no choice in the matter and negotiate more toughly with the Russians until we come up with a program that involves the minimal handling of this material, the minimal processing of this material, the minimal plumbing, the minimal dilution with the aqueous solutions or acid solutions, the minimal opportunities for environmental release, instead of the maximum exposure of the public, maximum handling, the maximum opportunities for diversion and environmental risk, which is the MOX program.

I frankly am just absolutely astounded that it takes a democratic administration with an environmental vice-president for us to embark on this idiocy.

It takes Duke Power Company to volunteer to step up to invite the public to wonder what on earth are they doing inviting mixed-oxide fuel to power their commercial reactors which are in trouble enough.

Now, I heard the discussion about beyond design base accidents, and I read with interest the supplement to your Environmental Impact Statement that finally gets around to